

Missouri Department of Natural Resources
Total Maximum Daily Load Information Sheet

Tributary to Hickory Creek

Water Body Segment at a Glance:

County: Grundy
Nearby Cities: Trenton
Length of impaired segment: 1.0 mile
Pollutant: Unknown
Source: None given
Water Body ID: 589



State Map Showing Location of Watershed

Scheduled for TMDL development: Approved by EPA 2010

Description of the Problem

Beneficial uses of Tributary to Hickory Creek

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health (Fish Consumption)
- Whole Body Contact Recreation

Use that is impaired

- Protection of Warm Water Aquatic Life

Standards that apply

Because Tributary to Hickory Creek has been listed as impaired for unknown pollutants, no identifiable numeric criteria apply. However, all Missouri Streams are protected by the general criteria contained in Missouri's Water Quality Standards at 10 CSR 20-7.31(3). The particular criteria that apply to this tributary state:

- (A) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses.
- (C) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.
- (D) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life.

(G) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community.

Background information and water quality data

The Tributary to Hickory Creek was first surveyed by the department in 2000. It was added to the 2002 303(d) List as part of 26 waters the department agreed to investigate for possible impairment as part of the 2001 Consent Decree, *American Canoe Association, et al. v. EPA*¹. The tributary was further studied during the department's Biological Assessment and Channel Evaluation in 2006-07. The tributary was dry in fall 2006, so only spring 2007 data were gathered. These showed that the Macroinvertebrate Stream Condition Index, or SCI, was 12 (Table 1). This score indicated the stream aquatic community was impaired, as a score of 16-20 is needed to be considered not impaired. In addition, the macroinvertebrates that were present were dominated by taxa that are tolerant of pollution. Stream habitat was not evaluated because there was no fall data to compare to. Water quality parameters did not identify a source of impairment (see Table 2) and did not violate Missouri's WQS. Additionally, the tributary was not channelized beyond possible bridge effect channelization. Evidence of impairment, therefore, was primarily narrative rather than numeric, indicated by the less than optimal aquatic community. There were no violations of Missouri's numeric WQS.

Due to the limited amount of data (one data set) for the tributary, another study was conducted in 2008-09. These were much wetter years than 2006-07, with record rainfall through the spring of 2008. This time, the data showed the biological community was not impaired (Table 1).

Table 1. SCI Scores for Tributary to Hickory Creek, 2007-2009

Site #	Site name	Date	SCI Score
1	Downstream of Hwy WW	Spring 2007	12
1	Downstream of Hwy WW	Fall 2008	18
2	Upstream of Hwy WW	Fall 2008	20
1	Downstream of Hwy WW	Spring 2009	20
2	Upstream of Hwy WW	Spring 2009	20

Scores of 16 or greater indicate an unimpaired aquatic community

The water quality parameters from the 2008-09 study also did not identify a source of impairment and did not violate Missouri's WQS. Besides the bioassessment study, the department went out six other times from Feb to May 2009 to collect sediment data (as Total Suspended Solids) at various flows. Water quality data from all of this monitoring is in Table 2.

Even though the biological assessment failed to show an impairment of the aquatic community and no state water quality criteria are violated, the data for total suspended solids (sediment) and the nutrient phosphorus from these studies are above regional ecosystem levels for creeks of this caliber. To address these, the TMDL targeted sediment and nutrients.

The U.S. Environmental Protection Agency approved this TMDL Nov., 17, 2010.

¹ No. 98-1195-CV-W in consolidation with No. 98-4282-CV-W, February 27, 2001.

Table 2. Water quality Data for Tributary to Hickory Creek, Grundy County

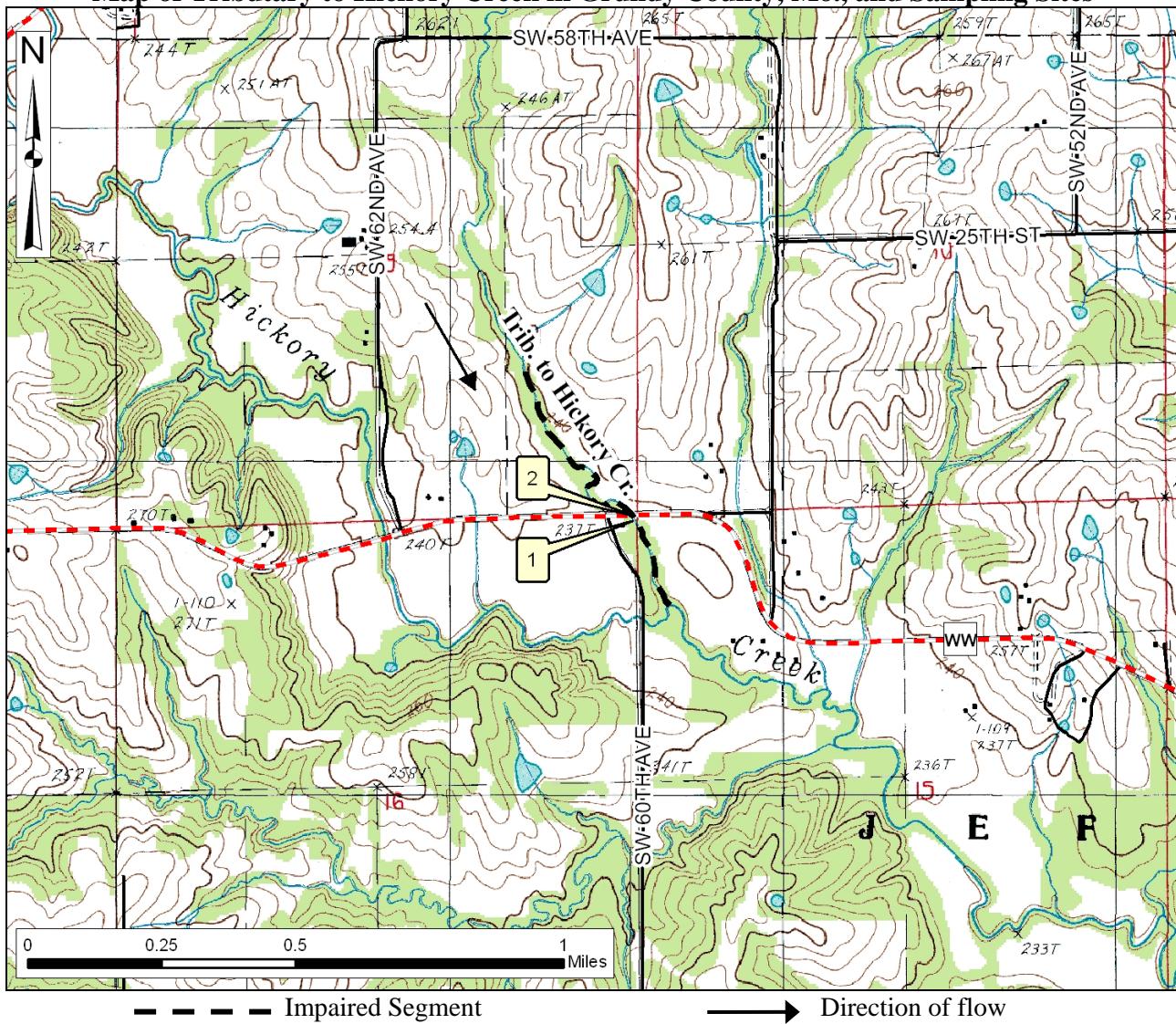
Units are milligrams per liter, or mg/L, unless otherwise noted

Site	Year	Mo	Day	Flow	C	DO	pH	SC	NH3N	NO3N	TN	TP	TSS	TRB	Cl
1	2007	3	28	0.32	17.5	8.5	7.9	546	0.01499	0.00499	0.31	0.05		2.25	15
1	2008	9	24	0.22	18.8	6.5	7.7	552	0.01499	0.00499	0.38	0.23		4.17	13.1
2	2008	9	24	0.21	21.5	6.1	7.9	566	0.01499	0.00499	0.38	0.16		3.95	12.8
2	2009	2	18	0.4	1.4	12		552					5		
2	2009	2	27	1	1.5	12.4	8.1	316					92		
2	2009	3	11	0.5	3.3	11.8	8.4	361					100		
1	2009	4	7	0.9	7.9	11.6	8.2	460	0.01499	0.13	0.42	0.00499	19	12.5	10.4
2	2009	4	7	0.9	10.8	10.4	8.3	457	0.001499	0.13	0.47	0.00499	12	8.23	10.4
2	2009	4	20	0.5	16.6	9.8	8.4	431					7		
2	2009	5	6	0.5	16.2	9	8.4	536					14		
2	2009	5	26	1.25	18.7	7.9	8.3	378					94		

Note: C=Temperature in degrees Celsius, DO=dissolved oxygen, SC=Specific conductivity in micromohs/centimeter (umohs/cm), NH3N=ammonia as nitrogen, NO3N=nitrate plus nitrite as nitrogen, TN=total nitrogen, TP=total phosphorus, TSS=total suspended solids, TRB=turbidity in NTU, Cl=chloride

A map of the impaired segment with sample site locations is shown on the next page.

Map of Tributary to Hickory Creek in Grundy County, Mo., and Sampling Sites



Site Description

- 1 – Trib. to Hickory Cr. downstream of State Highway WW
- 2 – Trib. to Hickory Cr. upstream of State Highway WW

For more information call or write:

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